

**CITY OF MARLBOROUGH CONTRIBUTORY  
RETIREMENT SYSTEM**

Actuarial Valuation Report

January 1, 1999

## TABLE OF CONTENTS

	<u>Page</u>
REPORT SUMMARY	
Highlights	1
Introduction	2
Actuarial Experience	3
 ACTUARIAL COSTS AND LIABILITIES	
Normal Costs	4
Present Value of Actuarial Accrued Liabilities	5
Present Value of Future Benefits	6
 FUNDED STATUS AND APPROPRIATIONS	
Market Value of Plan Assets	7
Unfunded Actuarial Accrued Liabilities	8
Appropriations	9
Appropriation Forecast	10
GAS No. 25 and GAS No. 27	12
PERAC Annual Statement	13
 EXHIBITS	
1 Age/Service Distribution with Salary	15
2 Retiree Distribution	16
3 Disabled Retiree Distribution	17
4 Summary of Plan Provisions	18
5 Actuarial Methods and Assumptions	25
6 Glossary of Terms	29
 CERTIFICATION	31

## Report Summary:

### Highlights

January 1, 1997

January 1, 1999

#### Contributions

Funding Schedule FY 2000	\$3,780,000	\$3,901,277
Funding Schedule FY 2001	3,916,000	4,023,815

#### Funded Ratios

GAS No. 25	56.0%	61.4%
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#### Participants

Actives	530	589
Inactives	71	67
Retirees and Beneficiaries	240	247
Disabilities	<u>36</u>	<u>36</u>
Total	877	939

#### Payroll

Payroll of Active Members	\$18,363,323	\$19,719,922
Average Payroll	34,648	33,480

#### Normal Cost

Employer	931,638	1,239,977
Employee	1,336,883	1,531,053
Administrative Expenses	<u>100,000</u>	<u>120,000</u>
Total	2,368,521	2,891,030

#### Actuarial Accrued Liabilities

Actives	36,245,194	44,057,162
Retirees, Beneficiaries, Disabilities and Inactives	<u>26,010,550</u>	<u>33,655,952</u>
Total	62,255,744	77,713,114

#### Actuarial Value of Assets

<u>34,858,241</u>	<u>47,693,554</u>
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#### Unfunded Actuarial Accrued Liabilities

\$27,397,503	\$30,019,560
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## **Introduction**

This report presents the City of Marlborough actuarial valuation findings as of January 1, 1999, under the Commonwealth of Massachusetts Retirement System.

The actuarial valuation is based on:

- Provisions of the General Laws of the Commonwealth of Massachusetts (principally Chapter 32) as of January 1, 1999, and Chapter 399 of the 1992 General Laws
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employees' Retirement Administration Commission by the City of Marlborough Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation also includes the contributions required under the provisions of Chapter 697 as interpreted by the Public Employees' Retirement Administration Commission (PERAC).

The valuation and appropriation forecast are prepared in accordance with Chapter 32 as of January 1, 1999. They account for:

- The passage of Chapter 306 regarding handling of administrative expenses
- The increased employee contribution rate of 9.0% of earnings effective for all future employees hired after July 1, 1996
- Annual cost-of-living adjustments (COLA) of 3.00%.

The valuation and forecast do not account for:

- Any other subsequent changes in the law
- Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

## **Actuarial Experience**

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the past two years since the last actuarial valuation the total unfunded actuarial accrued liability has increased by 9.6% (annualized) to \$30,019,560. The increase is the result of the passage of the COLA act by the city, offset by a \$4.9 million gain in actuarial experience. The gain was principally due to superior asset performance.

The actuarial assumptions have been changed to reflect current trends and in anticipation of future experience. The mortality and retirement tables have been changed to tables that more accurately reflect recent history. Finally, a \$120,000 load has been added directly to employer normal cost to account for administrative expenses replacing the \$100,000 assumption used two years ago.

## Actuarial Costs and Liabilities:

### Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

**Table I**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Superannuation	\$1,723,491	\$2,108,705
Death	146,099	285,251
Disability	253,531	276,696
Terminations	145,400	100,378
Administrative Expenses	<u>100,000</u>	<u>120,000</u>
Total Normal Cost	2,368,521	2,891,030
% of Pay	12.9%	14.7%
Employee Contributions	1,336,883	1,531,053
% of Pay	7.3%	7.8%
Employer Normal Cost	\$1,031,638	\$1,359,977
% of Pay	5.6%	6.9%

## **Present Value of Actuarial Accrued Liabilities**

The present value of actuarial accrued liabilities (AAL) represents today's value of all benefits earned by the actives and inactive. The AAL can be compared to the assets to determine the funded status of the Plan.

The value of these earned benefits is shown in Table II below.

**Table II**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Actives		
Superannuations	\$32,979,297	\$38,384,812
Death	1,890,822	3,089,440
Disability	1,703,407	2,771,826
Terminations	(328,332)	(188,916)
Inactives		
Retirees	21,368,263	26,583,084
Disabled Retirees	4,436,493	6,703,263
Inactives	<u>205,794</u>	<u>369,605</u>
Total	\$62,255,744	\$77,713,114

### **Present Value of Future Benefits**

The present value of future benefits represents today's value of all benefits earned by the inactive as well as all benefits earned and expected to be earned in the coming years by the active. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

**Table III**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Actives		
Superannuation	\$51,894,536	\$62,267,106
Death	3,501,619	6,256,461
Disability	4,521,930	6,120,817
Terminations	1,397,361	1,060,975
Inactives		
Retirees	21,368,263	26,583,084
Disabled Retirees	4,436,493	6,703,263
Inactives	<u>205,794</u>	<u>369,605</u>
Total	\$87,325,996	\$109,361,311

## Funded Status and Appropriations:

### Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

**Table IV**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Cash equivalents	\$732,669	\$2,995,606
Short term investments	0	0
Fixed income securities	15,603,531	19,349,657
Equities	10,502,526	11,493,796
Other	2,088,651	7,417,919
International	3,264,157	4,265,922
Accounts receivable	2,499,501	1,981,104
Accounts payable	(45,226)	(63,902)
Accrued income	<u>212,432</u>	<u>253,452</u>
Total Market Value	\$34,858,241	\$47,693,554
Total Actuarial Value	\$34,858,241	\$47,693,554

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## **Unfunded Actuarial Accrued Liabilities**

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL and the UAAL will be eliminated. Thereafter annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table V.

**Table V**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Actuarial Accrued Liability	\$62,255,744	\$77,713,114
Actuarial Assets	<u>34,858,241</u>	<u>47,693,554</u>
Unfunded Actuarial Accrued Liability	\$27,397,503	\$30,019,560
Funded Status	56.0%	61.4%

## **Appropriations**

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2028, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the prior unfunded actuarial accrued liability by June 30, 2020  
\$ 26,287,483 over 21 years with 3.5 % increasing payments
- Level amortization of the Early Retirement Incentive unfunded liability by June 30, 2008  
\$ 1,211,341 over 9 years
- Increasing amortization of the COLA unfunded actuarial accrued liability by June 30, 2020  
\$ 7,380,378 over 21 years with 3.5 % increasing payments
- Increasing amortization of the current actuarial (gains)/losses by June 30, 2020  
\$ (4,859,642) over 21 years with 3.5 % increasing payments
- Interest adjustment for payments contributed monthly over fiscal year.

The pension appropriation is shown in Table VI.

**Table VI**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
Normal cost	\$1,031,638	\$1,359,977
Amortization payment of the prior accrued liability	2,193,604	1,853,689
Amortization payment of ERI	179,547	179,547
Amortization payment of COLA liability	N/A	520,435
Amortization payment of current (gains)/losses	<u>(182,138)</u>	<u>(342,683)</u>
Total cost	\$3,222,651	\$3,570,965
% of Pay	17.5%	18.1%
Fiscal 2000 cost	\$3,780,000	\$3,901,277
Fiscal 2001 cost	\$3,916,000	\$4,023,815

### **Appropriation Forecast**

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2028 with replacement of members contributing 5%, 7%, and 8% with those contributing 9%. Payments are assumed to be spread over the fiscal year.

The employer total cost is expected to gradually increase during the next 21 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost increase represents on average about 19.8% of payroll and will decrease to 14.7% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of 5.3% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

**Appropriation Forecast  
(amounts in thousands)**

Fiscal Year Ending	Employee Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Funded Ratio %**
2000	\$19,720	\$1,531	\$1,486	\$2,416	\$3,901	19.8	61.4
2001	20,607	1,620	1,531	2,493	4,024	19.5	63.7
2002	21,535	1,714	1,577	2,574	4,150	19.3	66.0
2003	22,504	1,813	1,623	2,657	4,280	19.0	68.2
2004	23,516	1,918	1,671	2,743	4,414	18.8	70.3
2005	24,575	2,028	1,720	2,832	4,552	18.5	72.3
2006	25,680	2,144	1,770	2,924	4,695	18.3	74.3
2007	26,836	2,267	1,821	3,020	4,841	18.0	76.3
2008	28,044	2,397	1,873	3,119	4,992	17.8	78.2
2009	29,306	2,533	1,926	3,025	4,951	16.9	80.0
2010	30,624	2,677	1,980	3,131	5,111	16.7	81.6
2011	32,003	2,829	2,035	3,240	5,276	16.5	83.3
2012	33,443	2,989	2,091	3,354	5,445	16.3	84.9
2013	34,948	3,157	2,148	3,471	5,619	16.1	86.5
2014	36,520	3,335	2,206	3,592	5,798	15.9	88.1
2015	38,164	3,522	2,264	3,718	5,982	15.7	89.7
2016	39,881	3,720	2,324	3,848	6,172	15.5	91.3
2017	41,676	3,928	2,384	3,983	6,367	15.3	93.0
2018	43,551	4,147	2,444	4,122	6,567	15.1	94.7
2019	45,511	4,378	2,506	4,267	6,773	14.9	96.4
2020	47,559	4,622	2,568	4,416	6,984	14.7	98.2
2021	49,699	4,878	2,630	0	2,630	5.3	100.0
2022	51,935	5,149	2,693	0	2,693	5.2	100.0
2023	54,273	5,433	2,757	0	2,757	5.1	100.0
2024	56,715	5,733	2,820	0	2,820	5.0	100.0
2025	59,267	6,049	2,884	0	2,884	4.9	100.0
2026	61,934	6,382	2,947	0	2,947	4.8	100.0
2027	64,721	6,732	3,011	0	3,011	4.7	100.0
2028	67,633	7,102	3,074	0	3,074	4.5	100.0
2029	70,677	7,421	3,212	0	3,212	4.5	100.0
2030	73,857	7,755	3,357	0	3,357	4.5	100.0
2031	77,181	8,104	3,508	0	3,508	4.5	100.0

\* Calendar basis

\*\* As of beginning of the Fiscal Year

**GAS No. 25 and GAS No. 27**

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GAS Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to \$0. The required disclosure information is shown in Table VII.

**Table VII**

	<u>January 1, 1997</u>	<u>January 1, 1999</u>
(1) Actuarial Accrued Liability	\$62,255,744	\$77,713,114
(2) Actuarial Value of Assets	<u>34,858,241</u>	<u>47,693,554</u>
(3) Unfunded Actuarial Accrued Liability	27,397,503	30,019,560
(4) Funded Ratio (2)/(1)	56.0%	61.4%
(5) Covered Payroll	\$18,363,323	\$19,719,922
(6) UAAL as a percentage of payroll: (3)/(5)	149.2%	152.2%
(7) Annual Required Contribution (ARC)	\$3,647,852	\$3,901,277
(8) Net Pension Obligation	\$0	\$0

**PERAC Annual Statement**  
**APPENDIX PAGE 3**  
**ACTUARIAL VALUATION AND ASSUMPTIONS**

The most recent actuarial valuation of the System was prepared by PricewaterhouseCoopers LLP as of January 1, 1999.

The normal cost for employees on that date was:	\$1,531,053	7.8% of pay
The normal cost for the employer was:	1,239,977	6.3% of pay
The actuarial liability for active members was:		\$44,057,162
The actuarial liability for retired members was:		33,655,952
Total actuarial accrued liability:		77,713,114
System assets as of that date:		47,693,554
Unfunded actuarial accrued liability:		\$30,019,560

The ratio of system's assets to total actuarial liability was 61.4%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	8.0%
Rate of Salary Increase:	5.5%

**SCHEDULE OF FUNDING PROGRESS**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded Actuarial Accrued Liability (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a percent of Covered Payroll (b-a)/c
01/01/99	\$47,693,554	\$77,713,114	\$30,019,560	61.4%	\$19,719,922	152.2%
01/01/97	34,858,241	62,255,744	27,397,503	56.0%	18,363,323	149.2%
01/01/95	25,030,129	54,808,683	29,778,554	45.7%	15,449,152	192.8%

Attach Copy of Current Approved Funding Schedule

## **EXHIBITS**

## Age/Service Distribution with Salary as of January 1, 1999

Attained Age	Average Salary									
	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
20-24	15	0	0	0	0	0	0	0	0	15
	14,292	0	0	0	0	0	0	0	0	14,292
25-29	32	2	0	0	0	0	0	0	0	34
	17,690	32,714	0	0	0	0	0	0	0	18,573
30-34	19	21	7	1	0	0	0	0	0	48
	20,374	37,388	48,067	61,696	0	0	0	0	0	32,717
35-39	26	22	25	9	0	0	0	0	0	82
	19,389	39,979	49,679	51,951	0	0	0	0	0	37,722
40-44	40	18	16	16	1	0	0	0	0	91
	19,768	30,284	45,048	48,142	43,101	0	0	0	0	31,538
45-49	35	14	14	19	10	7	0	0	0	99
	22,308	23,191	40,390	48,388	58,822	61,304	0	0	0	36,441
50-54	23	18	18	8	5	19	2	0	0	93
	25,491	25,167	29,383	31,153	62,986	49,444	62,096	0	0	34,365
55-59	12	8	20	9	5	5	12	1	1	73
	22,891	38,554	30,609	36,835	41,942	56,462	58,808	68,804	56,326	39,037
60-64	7	3	9	6	3	4	4	1	0	37
	26,995	27,771	29,267	32,352	24,921	49,084	40,519	58,371	0	33,009
65-69	4	1	1	4	3	1	0	0	0	14
	21,832	18,392	31,982	32,697	34,530	34,157	0	0	0	29,017
70+	1	0	0	1	0	0	0	1	0	3
	10,397	0	0	10,794	0	0	0	38,424	0	19,872
Total Employees	214	107	110	73	27	36	18	3	1	589
Average Salary	20,518	32,365	39,101	42,950	49,419	52,260	55,109	55,200	56,326	33,480

## Retiree Distribution as of January 1, 1999

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	0	1	30,908	0	30,908
45-49	0	3	2	0	17,663	17,663
50-54	1	1	2	22,725	6,310	29,035
55-59	3	7	10	89,810	43,792	133,602
60-64	16	10	26	411,429	91,397	502,827
65-69	25	26	51	526,949	303,511	830,460
70-74	32	25	57	466,860	254,404	721,264
75-79	23	20	43	257,694	145,846	403,540
80-84	14	20	34	84,660	146,815	231,474
85-89	6	5	11	29,007	48,723	77,730
90-94	2	2	4	6,838	16,256	23,094
95-99	4	1	5	18,960	9,048	28,008
Total	127	120	247	1,945,840	1,083,765	3,029,605
Average (Age/Payment)	73.2	72.8	73	15,322	9,107	12,315
Frequency Percent	51.6	48.4	100	64.2	35.8	100

## Disabled Retiree Distribution as of January 1, 1999

Attained Age	Number of Employees			Total Payments		
	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	2	0	2	47,482	0	47,482
40-44	1	0	1	30,909	0	30,909
45-49	2	0	2	40,077	0	40,077
50-54	5	0	5	132,913	0	132,913
55-59	6	0	6	119,935	0	119,935
60-64	4	0	4	96,803	0	96,803
65-69	6	0	6	114,607	0	114,607
70-74	5	0	5	97,150	0	97,150
75-79	5	0	5	77,471	0	77,471
80-84	0	0	0	0	0	0
85-89	0	0	0	0	0	0
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	36	0	36	757,347	0	757,347
Average (Age/Payment)	62.1	N/A	62.1	21,037	N/A	21,037
Frequency Percent	100	N/A	100	100	N/A	100

## EXHIBIT 4 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 1999, and does not take into account any subsequent changes.

### 1. Administration

Each of the 107 contributory retirement systems for public employees for the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts general laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

### 2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporaries, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers and firefighters

For members in more than one group, participation will be proportional.

### 3. **Salary**

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

### 4. **Member Contributions**

Member contributions vary depending upon date hired as follows:

<b><u>Date of Hire</u></b>	<b><u>Member Contribution Rate</u></b>
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of \$30,000

### 5. **Average Salary**

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.)

### 6. **Creditable Service**

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

**7. Service Retirement**

a. Eligibility:

For an employee to be eligible for service retirement (also referred to as superannuation), the following conditions are to be met:

- (i) completion of 20 years of service
- (ii) for an employee prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service
- (iv) if an employee is a State police officer (Group 3), attainment of age 50

b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table:

<u>Age at Retirement</u>	<u>Percentage of Average Salary</u>		
	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

For Group 3 (State police), the benefit is 50% of the participant's final year's rate of regular salary, plus an additional 1% for each year of service in excess of 20 years.

In addition, for veterans (all groups) there is an additional benefit of \$15 per year for each year of service, up to a maximum of 20 years of service.

## **8. Deferred Vested Retirement**

### **a. Eligibility:**

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after 6 years.

### **b. Benefit Amount:**

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

### **c. Refund of Contributions:**

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

## **9. Accidental Disability**

### **a. Eligibility:**

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

### **b. Benefit Amount:**

The accidental disability amount is 72% of annual salary plus \$450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

**10. Ordinary Disability****a. Eligibility:**

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

**b. Benefit Amount:**

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

**11. Survivor Benefits****a. Occupational Death:**

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

**b. Non-Occupational Death:**

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of \$250 per month to the surviving spouse, plus \$120 for the first child, plus \$90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of \$250 per month plus \$120 for the first child and \$90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

**12. Cost-of-Living Increases**

In accordance with the adoption of Chapter 17 of the Acts of 1997 the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum pension benefit on which a COLA may be granted is \$12,000. All COLA's granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

**13. Postretirement Death Benefits**

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

- (i) Option A – Life annuity
- (ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member
- (iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

## EXHIBIT 5 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

### 1. **Member Data**

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

### 2. **Valuation Date**

January 1, 1999.

### 3. **Actuarial Cost Method**

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

### 4. **Rate of Investment Return**

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.0% per annum.

### 5. **Salary Scale**

It is assumed that salaries including longevity will increase at a rate of 5.5% per year.

### 6. **Cost-of-Living Increases**

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$12,000 per year.

**7. \$30,000 Pay Cap**

The \$30,000 salary cap no longer applies for purposes of benefit determination.

**8. Value of Investments**

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC).

**9. Annual Rate of Withdrawal Prior to Retirement**

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

<u>Age</u>	<u>General Employees</u>	<u>Police and Fire Employees</u>
20	0.1200	0.0210
30	0.0555	0.0165
40	0.0231	0.0056
50	0.0146	0.0000

**10 Annual Rate of Mortality**

It is assumed that both preretirement and postretirement mortality are represented by the 1983 Group Annuity Mortality Table (with margin) for males and females. Mortality for disabled members is represented by the 1983 Annuity Mortality Table set forward ten years for all disabled members.

**11. Service Retirement**

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

<b><u>Age</u></b>	<b><u>General Employees</u></b>	<b><u>Police and Fire Employees</u></b>
50	0.0000	0.1000
51	0.0000	0.0200
52	0.0000	0.0200
53	0.0000	0.0200
54	0.0000	0.0200
55	0.1255	0.2500
56	0.0321	0.0500
57	0.0310	0.0500
58	0.0334	0.0500
59	0.0348	0.0500
60	0.0784	0.2500
61	0.0692	0.0500
62	0.1511	0.0500
63	0.1071	0.0500
64	0.1037	0.0500
65	0.3568	1.0000
66	0.2214	1.0000
67	0.2159	1.0000
68	0.2164	1.0000
69	0.2536	1.0000
70	1.0000	1.0000

**12. Annual Rate of Disability Prior to Retirement**

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

<b><u>Attained Age</u></b>	<b><u>General Employees</u></b>	<b><u>Police and Fire Employees</u></b>
20	0.00015	0.00050
30	0.00028	0.00114
40	0.00055	0.00434
50	0.00153	0.00750

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

**13. Family Composition**

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

**14. Administrative Expenses**

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 1999 is \$120,000 and is anticipated to increase at 4.5% per year.

## EXHIBIT 6 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

### 1. **Actuarial Accrued Liability**

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

### 2. **Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

### 3. **Actuarial Cost Method**

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

### 4. **Actuarial Present Value**

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

### 5. **Forecast**

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

**6. Normal Cost**

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

**7. Unfunded Actuarial Accrued Liability**

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

**8. Valuation Method**

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

**9. Vested Liability**

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

## **CERTIFICATION:**

This report fairly represents the actuarial position of the City of Marlborough Contributory Retirement System contributing as of January 1, 1999, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost is reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

PricewaterhouseCoopers LLP

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Daniel W. Sherman, ASA, MAAA  
Enrolled Actuary No. 99-4086

October 11, 1999